

# **Session VII: Testing and Training Partnering - Industry & Community Perspective**

## **Modeling and Simulation to Evaluate Weapon Systems**

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Testing and Training: A National Partnership  
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# Today's Challenges For Industry

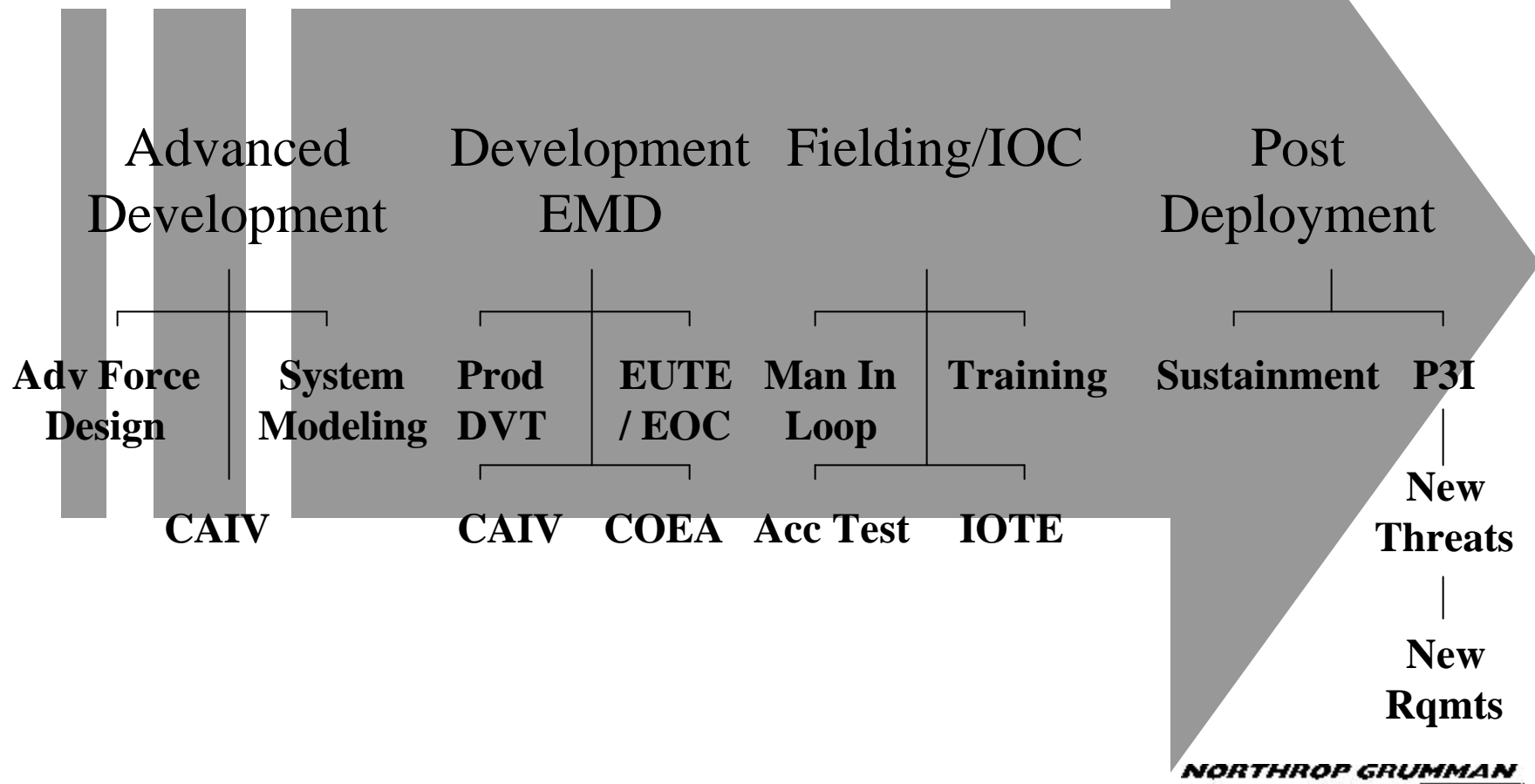
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- Architecture
  - **Interoperability of M&S Tools**
  - **Physical Based Modeling & Simulation**
- Infrastructure
  - **M & S Workforce**
  - **Incentives for M&S Use**
  - **Acceptance and Funding Process**
- Modeling Human Behavior Characteristics
  - **Sensory - Automatic, Volitional**
  - **Processing - Preparatory, Problem Solving, Decision-Making**
  - **Reaction - Physical, Psychomotor**
- Techniques for the continual development of “**Virtual Veterans**”. Soldiers who will have experienced, through training, the rigors of combat and the rigors of being under pressure prior to being sent into battle
  - **Elaborative Processing, Real World Cues (Auditory, Visual, and Olfactory) , Design for Retention**
- Embedded Simulation - **Real-Time Training 24 hours a day, 7 days a week, 365 days a year**
- Seamless Environment - **Live/Virtual/Constructive**
  - **MILES 2000**
  - **CCTT**
  - **WARSIM 2000**
- Seamless Acquisition Environment
  - **Facilitation of Acquisition Reform**
  - **Testlab and Battlelab programs**

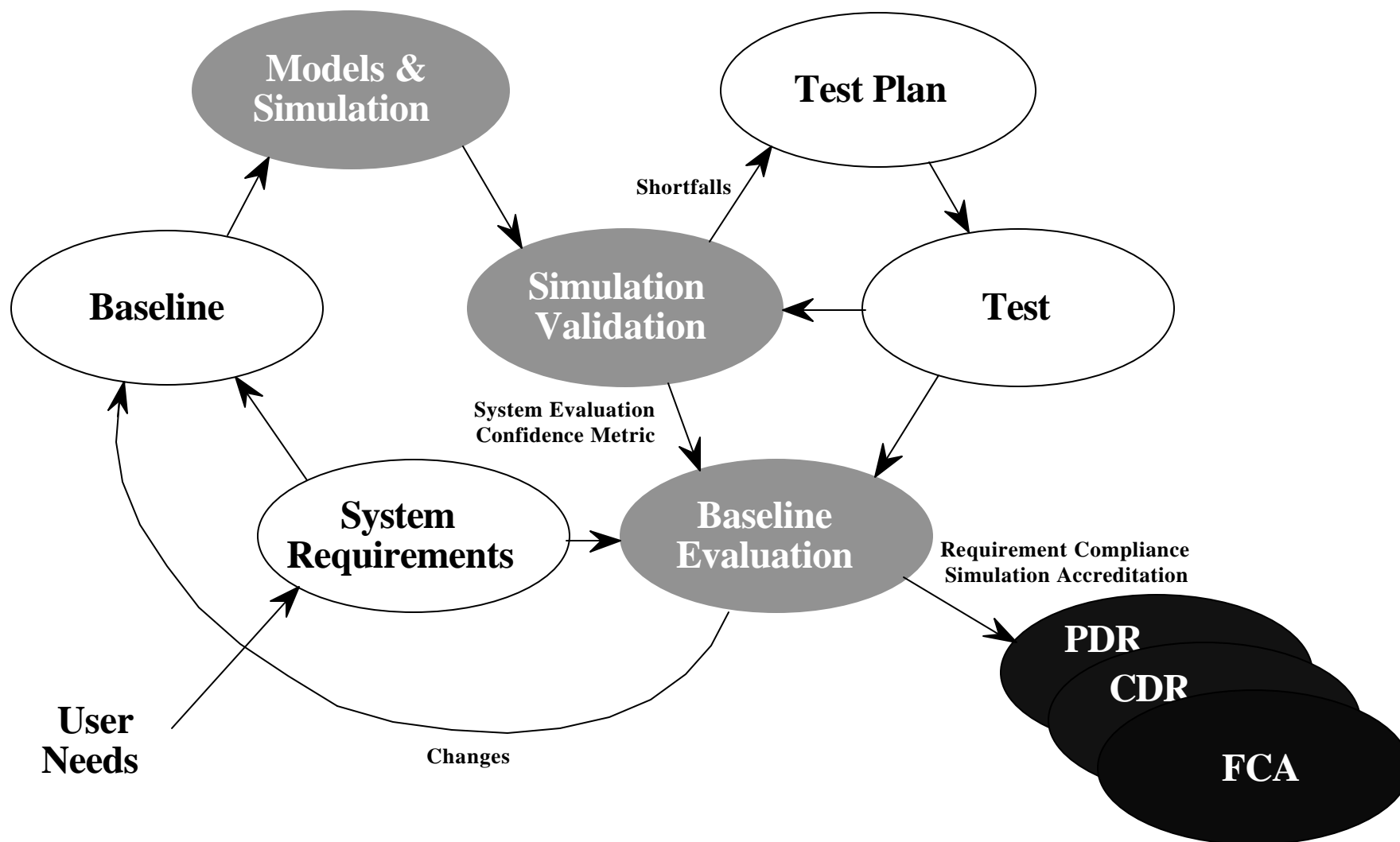


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## **Modeling & Simulation Play a Major Role In Every Phase of a Product Life Cycle**



# BAT Synthesis Process (U)



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# Confidence Phase Description (U)



CP	DESCRIPTION	OPERATIONAL DOMAIN	PAPER TO HARDWARE	SYSTEM/ SUBMODELS / MODELS	PARAMETERS/ SUBMODELS/ MODELS	DATA SOURCE
1	THEORY	NONE	PAPER	NA	Math Model, Critical Parameters / Acceptable Error Margins & Domain Established	None / Theory
2	VERIFICATION	NONE	CODE	NA	Simulation Critical Parameters Consistent With Theory	Hand Calc / Independent Sim Closure
3	REALIZATION	LIMITED (Lab Tests)	“BREADBOARD”	VERY LIMITED	1 Or More Critical Parameters Valid	Data Collections Breadboard Lab Test
4	RECURSION	LIMITED (Subsystem Test)	PROTOTYPE	LIMITED # APPLICABLE	1 Or More Submodels Valid	Wind Tunnel Captive Flight Test Acoustic Tests (SPT / RBAT)
5	INTEGRATION (One/Few-On-Many)	LIMITED (Submunition Flight Tests)	TACTICAL HW/SW (Submunition)	ALL APPLICABLE (Submunition)	Integrated Submunition Submodels Valid	Submunition Flight Tests (CDT/PPVT)
6	INTEGRATION (Many-On-Many)	LIMITED (Missile Flight Tests)	TACTICAL HW/SW (System)	ALL APPLICABLE (System)	Integrated System Submodels Valid	Missile Flight Tests
7	TACTICAL	ORD	TACTICAL HW/SW	ALL	Model Valid	Operation In Tactical Domain (M-On-M)

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## **BAT - Results**

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- **Simulation evaluation selected due to excessive direct test cost estimates:**
  - **> 15,000 BATS required to test all scenerios**
- **Test & Evaluation Program designed to provide high confidence simulations at milestone decision points**
  - **Process integral to the Test Evaluation Master Plan (TEMP)**
  - **Testing generates validation data**
  - **Simulations accredited with Operational Evaluations participation**
  - **Significant reduction in System Tests required:**
    - » **2-4 tests eliminated (estimated savings of \$40M)**
- **Program satisfied Milestone IIIA exit criteria**
  - **System simulation accredited and accepted by Evaluators**
  - **Production go-ahead decision given based on these simulations**

**TEMP and Synthesis Process now featured in DSMC Handbook**

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